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MEMORANDUM | June 19, 2026

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| TO | Wes Thomas and David Lacey, Oregon Department of Environmental Quality (DEQ) |
| FROM | Peter Shanahan, HydroAnalysis LLC (HALLC); Jennifer Hart and Gail Fricano, Industrial Economics, Inc. (IEc) |
| SUBJECT | Five Tribe review of "2025 Hydraulic Control and Containment System Annual Report" for the Gasco upland site, dated May 15, 2026 |

This memorandum, submitted on behalf of the Five Tribes,[1] reviews the *2025 Hydraulic Control and Containment System Annual Report* (2025 HC&C Annual Report) for the Gasco upland site prepared by Anchor QEA on behalf of NW Natural (Anchor QEA).

## General Comments

1. We generally agree with the conclusion stated in Section 6.1 that the Hydraulic Control and Containment (HC&C) System is meeting design objectives.

## Specific Comments

2. Section 2.3 discusses the cumulative mass of contaminants removed with the groundwater pumped by the various treatment systems on site. However, the tabulated data show that the concentrations measured in influent groundwater (i.e., untreated groundwater pumped to the NW Natural Pretreatment Plant) are variable over time, with occasional excursions in the monthly values. For example, Table 2-4 shows atypically high concentrations of the polynuclear aromatic hydrocarbon (PAH) compounds benzo(a)pyrene and naphthalene in January, June, and July 2019. In contrast, Table 2-4 shows the concentration of iron to be comparatively steady from month-to-month during this same period. These differences in contaminant concentrations measured and removed likely reflect on the operations of the HC&C system. We therefore recommend that the report discuss the variations in concentrations over time and offer explanations for the different trends and particularly the high-concentration excursions. A particular concern is that these high-concentration excursions of PAH compounds may indicate mobilization of dense nonaqueous phase liquid (DNAPL).

3. Section 5.1.3 points out, correctly, that concentrations of contaminants in groundwater have tended to be stable over the past nine years. However, many measured concentrations of benzo(a)pyrene and naphthalene, though stable, exceed their solubility limits in water. This

[1] The five tribes are the Confederated Tribes of the Grand Ronde Community of Oregon, the Nez Perce Tribe, the Confederated Tribes of Siletz Indians, the Confederated Tribes of the Umatilla Indian Reservation, and the Confederated Tribes of the Warm Springs Reservation of Oregon.

indicates that DNAPL is likely nearby and is affecting groundwater quality. For example, WS-13-69 in the Upper Alluvium shows concentrations of naphthalene well above its solubility limit despite a lack of mapped DNAPL in its immediate vicinity (Anchor QEA, 2026, Figures 3-1c and d). The reported solubility exceedance suggests that DNAPL may be more widespread than mapped. We recommend the report discuss where water-quality concentrations are indicative of the presence of not-currently-mapped DNAPL.

4. Sections 5.2.2 and 5.2.3 point out increases in the concentration of benzene, toluene, ethylbenzene, and xylenes (BTEX) and total volatile organic compounds (VOCs) in 2019 and 2020 but offer no explanation. We recommend more explanation of these events. Were there events on the ground (e.g., a spill) that caused the increase?

5. Section 5.3.1 states with respect to water quality over time as shown in Appendix G that "…groundwater chemistry conditions have continued to be relatively stable across the site during the past 9 years." This is true with the notable exception of well WS-25-96 in Figure G.4.a.44, which shows a distinct upward trend in the concentration of benzene. We recommend this exception be discussed in the text and, if possible, explained.

6. Several of the figures in Appendix B1, specifically in the series of Figures 5.1 through 5.21, show departures in water elevation differences that commence on or about the first of the month, suggesting maintenance activity of some sort may have introduced systematic changes. A few examples from Appendix B1 include Figure 5.4 starting around June 1, Figure 5.7 starting around April 1, and Figure 5.15 starting around May 1. We recommend that these figures be annotated to indicate if transducers were recalibrated or other maintenance conducted that caused systematic changes. The departures exceed the margin of error attributed to the measurements and raise questions as to the accuracy of conclusions regarding maintenance of desired hydraulic gradients.

7. In Appendix B2, Figure 7-29 includes explanations for periods of decreased pumping but Figure 7-29 in Appendix B1 does not. The latter figure shows significantly lower pumping rates over periods of several days in late February and late March. We recommend that explanations for these downward excursions be added to the figure in Appendix B1.

## Editorial Comments

8. Section 3.1.1.1 includes a footnote describing the Serfes (1991) method as a "three-day rolling average." This is not strictly correct; it is neither three-day nor a rolling average. It is in fact computed over 71 hours, an even multiple of the 6-hour and 25-minute tidal cycle, and not three days. Nor is it a rolling average, but in fact a more complicated filtering calculation. We recommend a more accurate description be provided.

## References

Anchor QEA. 2026. 2025 Hydraulic Control and Containment System Annual Report, Prepared for NW Natural. Anchor QEA, Portland, Oregon. May 15.

Kueper, B. H., and K. L. Davies. 2009. Assessment and Delineation of DNAPL Source Zones at Hazardous Waste Sites. Report Number EPA/600/R-09/119. National Risk Management Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, Ohio. September.

Serfes, M.E. 1991. Determining the Mean Hydraulic Gradient of Groundwater Affected by Tidal Fluctuations. Ground Water, 29(4): 549–555.